



# *Hydrolaetare schmidtii* (Cochran & Goin, 1959): new records for Amapá state, eastern Amazon and a geographic distribution map

Janaina Reis Ferreira Lima<sup>1,2</sup>, Jucivaldo Dias Lima<sup>1,2</sup>, Jackson Cleiton Sousa<sup>3</sup>, Silvia Helena de Oliveira<sup>4</sup>, Carlos Eduardo Costa-Campos<sup>3</sup>

**1** Instituto de Pesquisas Científicas e Tecnológicas do Amapá (IEPA) – Nucleo de Biodiversidade (NUBIO), Laboratório de Herpetologia, Rodovia Juscelino Kubitschek, s/n, Distrito da Fazendinha, Macapá, Amapá, Brazil. **2** Programa de Pós-Graduação em Desenvolvimento Regional – PPGMDR (Universidade Federal do Amapá), Macapá, Amapá, Brazil. **3** Universidade Federal do Amapá, Departamento de Ciências Biológicas e da Saúde, Laboratório de Herpetologia, Rodovia Juscelino Kubitschek, Km 02, Bairro Jardim Marco Zero, Macapá, Amapá, Brazil, 68.903-419. **4** Maracajá Assessoria Ambiental, Rua Mário Cunha Júnior, 858, Jardim Diamante, Sertãozinho, São Paulo, Brazil, 14.177-145.

**Corresponding author:** Carlos Eduardo Costa-Campos, [ceccampos@unifap.br](mailto:ceccampos@unifap.br)

## Abstract

*Hydrolaetare schmidtii* (Cochran & Goin, 1959) is 1 of 3 species of a genus that has a disjunctive distribution in the Amazon basin and is considered to be rare. Herein, we present the new records of *H. schmidtii* from Amapá State, Brazil. This new record establishes the fifth known occurrence for *H. schmidtii* and fills a gap of about 295 km in the distribution of the species, between Ouanari (French Guiana) and Tumucumaque Mountains National Park, Anacui River, municipality of Serra do Navio (Amapá).

## Key words

Amazon basin, Anura, Leptodactylidae, range extension.

**Academic editor:** Ivan Nunes | Received 16 October 2018 | Accepted 26 March 2019 | Published 20 September 2019

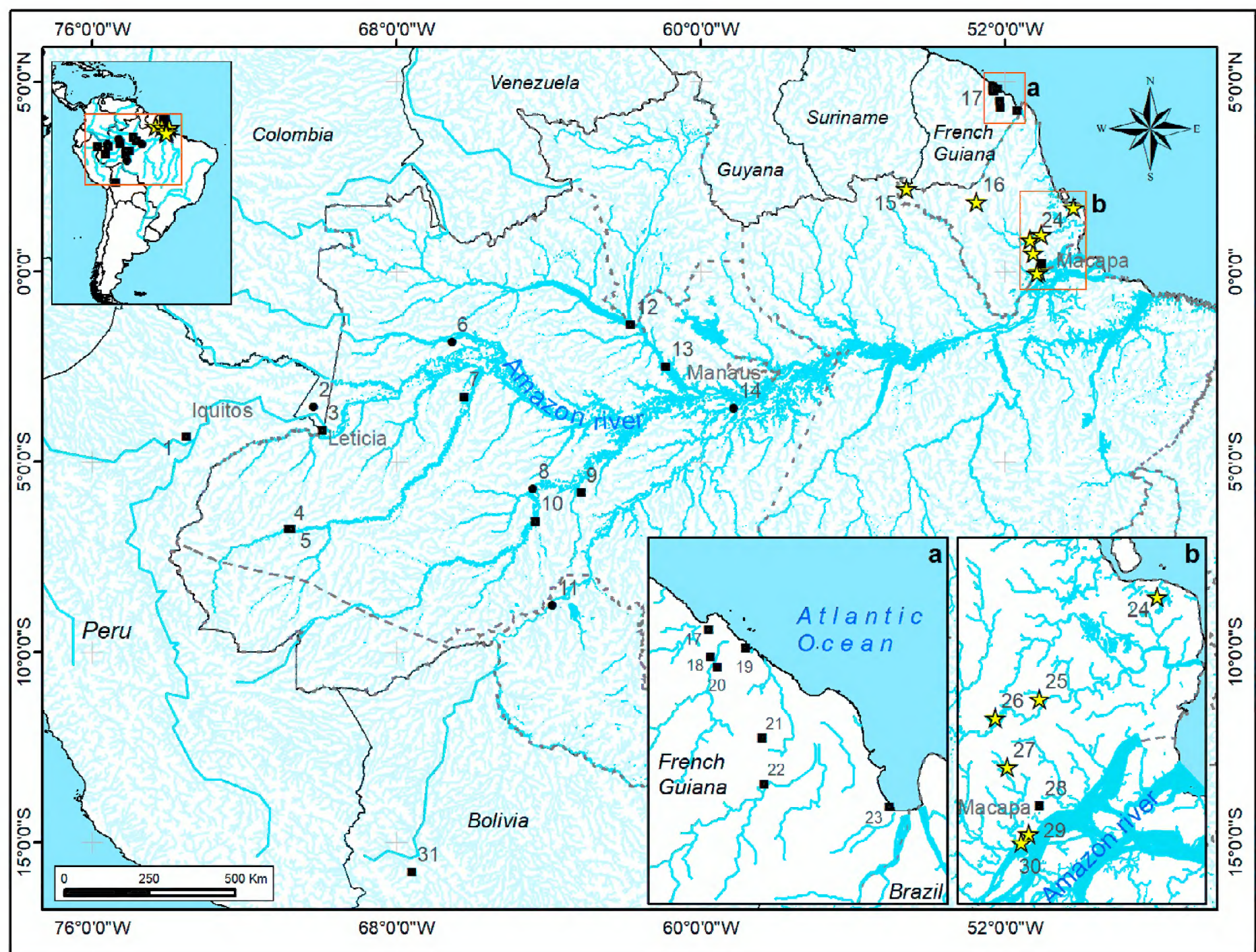
**Citation:** Ferreira Lima JR, Dias Lima J, Sousa JC, Oliveira SH, Costa-Campos CE (2019) *Hydrolaetare schmidtii* (Cochran & Goin, 1959): new records for Amapá state, eastern Amazon and a geographic distribution map. Check List 15 (5): 815–819. <https://doi.org/10.15560/15.5.815>

## Introduction

In the family Leptodactylidae, the genus *Hydrolaetare* (Galardo, 1963) consists of anuran species that have a disjunctive distribution in the Amazon basin, from Bolivia and the Madeira River basin and state of Acre in northwestern Brazil to scattered locations in Colombia, Peru and French Guiana (De La Riva et al. 2000, Jansen et al. 2007, Souza 2009, Ferrão et al. 2014). Currently, the genus has 3 species (Frost 2018): *H. caparu* Jansen, Gonzales-Álvarez & Köhler, 2007; *H. dantasi* (Bokermann, 1959) and *H. schmidtii* (Cochran & Goin, 1959).

*Hydrolaetare schmidtii* (Cochran and Goin, 1959) is one of 3 species of frogs considered rare in Amazon (Padial and La Riva 2005, Ferrão et al. 2014). Although *H. schmidtii* is listed in the state of least concern in the IUCN Red List of Threatened Species, based on its wide distribution and presumed population size (Azevedo-Ramos et al. 2004), little is known about the natural history of this nocturnal aquatic frog that can be found on the banks of lakes and slow rivers (Rodríguez and Duellman 1994, Lescure and Marty 2000, De Souza and Haddad 2003, Souza 2009). The males are observed in flooded subterranean tunnels near water, the vocalization





**Figure 1.** Geographic distribution of *Hydrolaetare schmidtii* in Brazil (Amapá, Amazonas, Roraima, Rondônia), Peru, Bolívia, Colômbia and French Guiana. Distribution records and their respective coordinates are provided in the Table 1. Literature and SpeciesLink records (black square); new records for state of Amapá (star).

being known by a series of low groans (Rodríguez and Duellman 1994). Herein, we present the new records of *H. schmidtii* from Amapá State, Brazil.

## Methods

The new records were based on field sampling techniques (Heyer et al. 1994) and museum specimens in the Herpetological Collection of the Museu Paraense Emílio Goeldi “Oswaldo Rodrigues da Cunha” (MPEG) and the Collection of the Fauna of Amapá at the Amapá State Institute for Scientific and Technological Research (IEPA). Additionally, we also obtained distribution records at SpeciesLink database (SpeciesLink 2018) and literature records to produce the new distribution map of the species.

## Results

**New records.** Brazil: Amapá state: Municipality of Macapá (00.0242° N, 051.1019° W), at savanna with forest edge in the area belonging to the 34th infantry battalion of Amapá, Janaína R. F. Lima and Jucivaldo D. Lima collectors, 8 May 2004 (1 specimen, IEPA 239); Municipality of Amapá (01.6949° N, -50.1963° W), on the Lago

Piratuba Biological Reserve in the region of Tabacos, Janaína R. F. Lima and Jucivaldo D. Lima collectors, 27 March 2007 (7 specimens, IEPA 4039-4045); Municipality of Laranjal do Jari (02.1933° N, 054.5875° W), at Tumucumaque Mountains National Park, Mapaoni River, Jucivaldo D. Lima observer, 17 January 2008 (advertisement call from 1 male, not collected); Municipality of Porto Grande (00.4951° N, 051.2552° W), at Matapi farm belonging to Amapá Florestal Celulose S.A., Janaína R. F. Lima and Jucivaldo D. Lima collectors, 4 February 2008 (1 specimen, IEPA 4708); Municipality of Serra do Navio (01.8447° N, 052.7411° W), at Anacuí River margins, Jucivaldo D. Lima observer, 26 March 2008 (advertisement call from 1 male, not collected); Municipality of Porto Grande (00.8438° N, 051.3382° W), at area of the Cachoeira Caldeirão Hydroelectric Power Plant, Sílvia H. Oliveira observer, 18 April 2009 (advertisement call from 1 male, not collected); Municipality of Santana (00.0363° N, 051.1624° W), in the secondary forest, Jackson C. Sousa recorded, 8 January 2016 (advertisement call from 1 male, not collected); Municipality of Santana (0.0363° N; 51.1624° W), within a vertical underground tunnel of approximately 70 cm deep and 15 cm in diameter and flooded with water, Jackson C. Sousa observer, 3 June 2018 (1 male, Herpetological Collection



of the Universidade Federal do Amapá, under the care of Carlos Eduardo Costa Campos, CECCAMPOS 2667; see Table 1, Fig. 1).

**Additional materials examined.** Brazil: Amapá state: Municipality of Tartarugalzinho (00.9776° N, 051.0284° W), Francisco P. Nascimento collector, 10 July 1969 (2 specimens, MPEG 814, MPEG 8126); Municipality of Macapá, Rio Curiaú Environmental Protection Area (00.2237° N, 051.0310° W), in a temporary pond, Janaína R. F. Lima and Jucivaldo D. Lima collectors, 7 May 2013 (1 specimen, IEPA 4024; see Table 1; Fig. 1).

**Identification.** We were able to identify the specimens (Fig. 2) based on the following traits provided by Rodríguez and Duellman (1994): snout-vent length from 80–104 mm in males and 115 mm in females; body and limbs are robust and the head is broad and depressed; dorsum is dull olive green with dark brown markings-large blotch on back, canthal stripe, bars on the lips, and transverse marks on the limbs, and venter is creamy yellow with bold dark brown reticulations or spots; eyes are large and dorsolateral with vertically elliptical pupils; tympanum is half the size of the eye; toes are long, pointed, and fully webbed.

Discussion

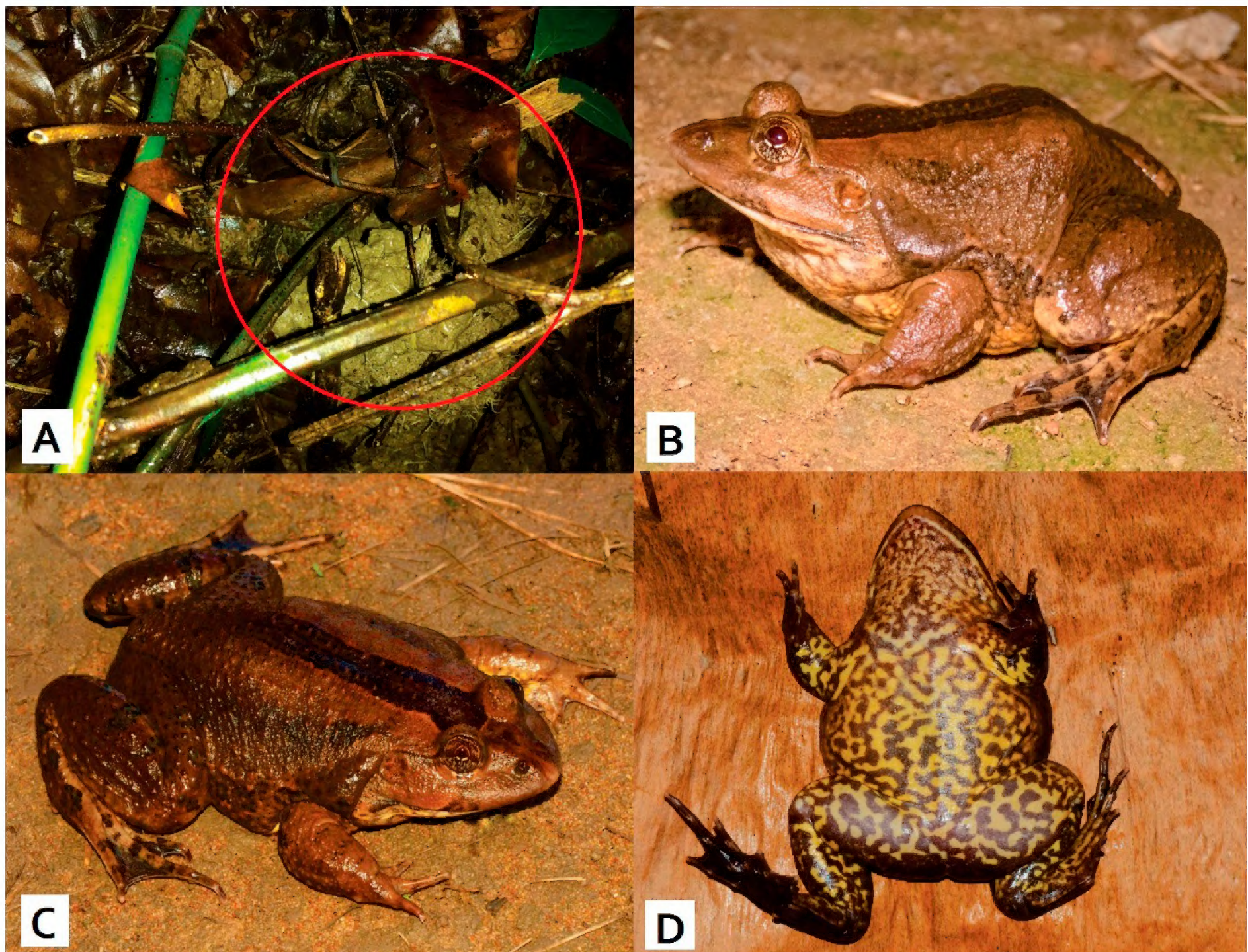
The specimens of *H. schmidt* were found in temporary ponds in both primary and secondary terra-firme forest. The specimens recorded at Rio Curiaú Environmental Protection Area were found on the Amazonian savanna. The phytophysiognomy of the study area is composed mainly of savanna, with islands of savanna forest, and as some lakes are found in the vicinity of these forests, the anuran species composition may be enriched by this environment, due to the use of these pools by many forest-dwelling species that have aquatic larvae (Lima et al. 2017). The fact that this species has been recorded in forest habitats in other studies (Ávila-Pires et al. 2010, Waldez et al. 2013, Lima et al. 2015), suggests that their presence in the study area was due to the proximity of the ponds surveyed to the forest patches found in the local landscape.

The geographical distribution of *H. schmidt* includes 9 localities in Amapá state, in addition to our record: This new record establishes the fifth known occurrence for *H. schmidt* and fills a gap of about 295 km in the distribution of the species, between Ouanari (French Guiana) and Tumucumaque Mountains National Park, Anacui River, municipality of Serra do Navio (Amapá) (Fig. 1; Table 1).

**Table 1.** Previous records of *Hydrolaetare schmidt* in Brazil, Peru, Bolívia, Colômbia and French Guiana from literature and SpeciesLink records. Numbers refer to those plotted in Figure 1.

No.	Latitude	Longitude	Collection site	Reference
1	−04.31	−073.52	Loreto, Peru	Rodríguez and Duellman (1994)
2	−03.53	−070.18	National Park Amacayacú, Colômbia	SpeciesLink (2018)
3	−04.15	−069.95	Letícia, Colômbia	Cochran and Goin (1959)
4	−06.75	−070.85	River Juruá, Amazonas	Ferrão et al. (2014)
5	−06.74	−070.78	Seringal Condor, Amazonas	Ferrão et al. (2014)
6	−01.83	−066.55	River Auati-Paraná, Amazonas	SpeciesLink (2018)
7	−03.28	−066.23	Vira-Volta Village, Amazonas	Ferrão et al. (2014)
8	−05.69	−064.42	Igarapé do Paripi, Purus River, Amazonas	SpeciesLink (2018)
9	−05.80	−063.15	National Park Nascentes do Lago Jari, Amazonas	Ferrão et al. (2014)
10	−06.55	−064.35	Purus River	Waldez et al. (2013)
11	−08.76	−063.90	Rondônia	SpeciesLink (2018)
12	−01.38	−061.85	Branco River, Roraima	Ferrão et al. (2014)
13	−02.47	−060.92	Anavilhanas Archipelago, Amazonas	Ferrão et al. (2014)
14	−03.57	−059.13	Autazes, Amazonas	SpeciesLink (2018)
15	02.19	−054.58	Tumucumaque Mountains National Park, Mapaoni River, Laranjal do Jari, Amapá	This study
16	01.84	−052.74	Tumucumaque Mountains National Park, Anacui River, Serra do Navio, Amapá	This study
17	04.89	−052.33	Cayenne, French Guiana	Lescure and Marty (2000)
18	04.79	−052.32	Cayenne, French Guiana	Lescure and Marty (2000)
19	04.82	−052.19	Roura, French Guiana	Lescure and Marty (2000)
20	04.75	−052.30	Roura, French Guiana	Lescure and Marty (2000)
21	04.50	−052.13	Kaw, French Guiana	Lescure and Marty (2000)
22	04.33	−052.13	Guisanbourg, French Guiana	Lescure and Marty (2000)
23	04.25	−051.67	Ouanari, French Guiana	Lescure and Marty (2000)
24	01.69	−050.19	Lago Piratuba Biological Reserve, Tabacos region, Amapá	This study
25	00.97	−051.02	Tracajuba River, Tartarugalzinho, Amapá	This study
26	00.84	−051.33	Cachoeira Caldeirão Hydroelectric Power Plant, Ferreira Gomes, Amapá	This study
27	00.49	−051.25	Amapá Florestal Celulose S.A, Matapi farm, Porto Grande, Amapá	This study
28	00.22	−051.03	Rio Curiaú Environmental Protection Area, Macapá, Amapá	Lima et al. (2017)
29	00.02	−051.10	Macapá, Amapá	This study
30	−00.03	−051.15	Santana, Amapá	This study
31	−015.76	−067.61	Bolívia	Padial and De La Riva (2005)





**Figure 2.** Adult male of *Hydrolaetare schmidtii* (CECCAMPOS 2667; SVL = 95.65 mm) collected in the municipality of Santana, state of Amapá, eastern Amazon. **A.** Tunnel dug by *Hydrolaetare schmidtii*. **B.** Lateral view. **C.** Dorsal view. **D.** Ventral view.

In Amapá state, *H. schmidtii* was not recorded for more than 35 years, until 2004. Posteriorly, new records of this species were made regularly, contributing significantly to the increase of knowledge of geographical distribution of the species in the state of Amapá and it enables a better assessment of its conservation status. *Hydrolaetare schmidtii* appears well-distributed in Amapá. Probably the lack of records is associated with poor sampling in environments used by the species. In the study of Lima (2017), *H. schmidtii* was recorded in only 5 localities (Tumucumaque Mountains National Park, Lago Piratuba Biological Reserve, Cachoeira Caldeirão Hydroelectric Power Plant and Amapá Florestal Celulose S.A.) of the 39 points sampled in the state of Amapá (Lima 2017), indicating low diversity and a small number of records in amphibian assessments in Amazonian studies (Ferrão et al. 2014).

## Acknowledgements

We thank the Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) for providing collection permits (SISBIO #48102-2). We thank Victor Rodrigues for help with the construction of the map.

## Authors' Contributions

All authors wrote, revised, finalized, and approved the manuscript.

## References

- Ávila-Pires TCS, Hoogmoed MS, Rocha WA (2010) Notes on Vertebrates of Northern Pará, Brazil: a forgotten part of the Guianan Region, I. Herpetofauna. Boletim do Museu Paraense Emílio Goeldi, Ciências Naturais 5 (1): 13–112.
- Azevedo-Ramos C, Reynolds R, Hoogmoed M, Gascom C (2004) *Hydrolaetare schmidtii*. IUCN Red List of Threatened Species. Version 2012.2. <http://www.iucnredlist.org>. Accessed on: 2018-4-4.
- Cochran DM, Goin CJ (1959) A new frog of the genus *Limnomedusa* from Colombia. Copeia 1959 (3): 208–210. <https://doi.org/10.2307/1440389>
- De La Riva I, Köhler J, Lötters S, Reichle S (2000) Ten years of research on Bolivian amphibians: updated checklist, distribution, taxonomic problems, literature and iconography. Revista Española de Herpetología 14: 19–164.
- De Souza MB, Haddad CFB (2003) Redescription and reevaluation of the generic status of *Leptodactylus dantasi* (Amphibia, Anura, Leptodactylidae) and description of its unusual advertisement call. Journal of Herpetology 37: 490–497. <https://doi.org/10.1670/259-01A>
- Ferrão M, de Fraga R, Simões PI, Lima AP (2014) On the poorly sampled Amazonian frogs genus *Hydrolaetare* (Anura: Leptodactyl-



- idae): geographic ranges and species identification. *Salamandra* 50 (2): 77–84.
- Frost D R (2018) Amphibian Species of the World: an Online Reference. Version 6.0. New York, American Museum of History. <http://research.amnh.org/herpetology/amphibia/index.html>. Accessed on: 2018-6-4.
- Heyer W R, Donnelly M A, McDiarmid R W, Hayek L A C, Foster M S (1994) Measuring and Monitoring Biological Diversity: Standard Methods for Amphibians. Biological Diversity Handbook Series. Smithsonian Institution Press, Washington, DC, 384 pp.
- Jansen M, Álvarez LG, Köhler G (2007) New species of *Hydrolaetare* (Anura, Leptodactylidae) from Bolivia with some notes on its natural history. *Journal of Herpetology* 41: 724–732. <https://doi.org/10.1670/06-289.1>
- Lescure J, Marty, C (2000) Atlas des Amphibiens de Guyane. *Patrimoines Naturels* 45: 1–388.
- Lima JR, Galatti U, Lima CJ, Faveri SB, Vasconcelos HL, Neckel-Oliveira S (2015) Amphibians on Amazonian land-bridge islands are affected more by area than isolation. *Biotropica* 47 (3): 369–376. <https://doi.org/10.1111/btp.12205>
- Lima JRF, Lima JD, Lima SD, Silva RBL, Andrade GV (2017) Amphibians found in the Amazonian savanna of the Rio Curiaú Environmental Protection Area in Amapá, Brazil. *Biota Neotropica* 17: e20160252. <https://doi.org/10.1590/1676-0611-bn-2016-0252>
- Lima JR (2017) Anfíbios e répteis do estado do Amapá: contribuições para a conservação da herpetofauna amazônica. Doctoral thesis, Universidade Federal do Amapá, 163pp.
- Padial JM, De La Riva I (2005) First record of *Hydrolaetare schmidtii* (Cochran & Goin, 1959) for Bolivia and new distributional data of Bolivian Anurans. *Herpetozoa* 18: 65–67.
- Rodríguez LO, Duellman WE (1994) Guide to the frogs of the Iquitos region, Amazonian Peru. University of Kansas Natural History Museum Special Publication 22: 1–80.
- Souza MB (2009) Anfíbios: Reserva Extrativista Alto Juruá e Parque Nacional Serra do Divisor. IFCH, Campinas, 77 pp. + 32 pls.
- SpeciesLink (2018) Sistema de Informação Distribuído para Coleções Biológicas. <http://www.splink.org.br>. Accessed on: 2018-08-16.
- Waldez F, Menin M, Vogt R (2013) Diversidade de anfíbios e répteis Squamata na região do baixo rio Purus, Amazônia Central, Brasil. *Biota Neotropica* 13 (1): 300–316. <https://doi.org/10.1590/S1676-06032013000100029>